

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
10 May 2001 (10.05.2001)

PCT

(10) International Publication Number
WO 01/32898 A3

- (51) International Patent Classification⁷: C12N 15/86, 15/12, C07K 14/47, A61K 48/00
- (21) International Application Number: PCT/JP00/07737
- (22) International Filing Date:
2 November 2000 (02.11.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/163,055 2 November 1999 (02.11.1999) US
11-359218 17 December 1999 (17.12.1999) JP
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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- (88) Date of publication of the international search report:
7 September 2001
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 01/32898 A3

(54) Title: RECOMBINANT SENDAI VIRUS VECTOR FOR INTRODUCING EXOGENOUS GENES TO AIRWAY EPITHELIA

(57) Abstract: Provided are a recombinant Sendai virus vector for introducing exogenous genes to airway epithelia and a method for introducing exogenous genes using the vector. The recombinant Sendai virus vector enables efficient gene transfer to native mucus-layered airway epithelial cells by briefly contacting the vector with the cells. Furthermore, the vector can introduce genes to not only apical surfaces but also submucosal glands where CFTR primarily expresses. The vector can thus be used for gene therapy of CF, a CFTR-deficient disease.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 00/07737

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/86 C12N15/12 C07K14/47 A61K48/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C07K A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, MEDLINE, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	YONEMITSU Y. ET AL.: "HVJ (Sendai virus)-cationic liposomes: A novel and potentially effective liposome-mediated technique for gene transfer to the airway epithelium." GENE THERAPY, vol. 4, no. 7, 1997, pages 631-638, XP000992923 ISSN: 0969-7128 the whole document --- -/--	1-10



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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O document referring to an oral disclosure, use, exhibition or other means

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X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

23 April 2001

Date of mailing of the international search report

11/05/2001

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 00/07737

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	HASAN M. K. ET AL.: "CREATION OF AN INFECTIOUS RECOMBINANT SENDAI VIRUS EXPRESSING THE FIRELY LUCIFERASE GENE FROM THE 3' PROXIMAL FIRST LOCUS" JOURNAL OF GENERAL VIROLOGY, vol. 78, no. 11, 1997, pages 2813-2820, XP000886572 ISSN: 0022-1317 the whole document	1-10
A	SAEKI Y. ET AL.: "Development and characterization of cationic liposomes conjugated with HVJ (Sendai virus): reciprocal effect of cationic lipid for in vitro and in vivo gene transfer." HUMAN GENE THERAPY, vol. 8, 20 November 1997 (1997-11-20), pages 2133-2141, XP000992958 the whole document	1-10
A	SAKAI Y. ET AL.: "ACCOMMODATION OF FOREIGN GENES INTO THE SENDAI VIRUS GENOME: SIZES OF INSERTED GENES AND VIRAL REPLICATION" FEBS LETTERS, vol. 456, 6 August 1999 (1999-08-06), pages 221-226, XP000887286 ISSN: 0014-5793 the whole document	1-10
P,X	YONEMITSU Y. ET AL.: "Efficient gene transfer to airway epithelium using recombinant Sendai virus." NATURE BIOTECHNOLOGY, vol. 18, no. 9, September 2000 (2000-09), pages 970-973, XP002165781 ISSN: 1087-0156 the whole document	1-10

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